15¢

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • MARCH 23, 1946

Spring Plowing

See Page 182

A SCIENCE SERVICE PUBLICATION

1921 TWENTY-FIFTH ANNIVERSARY 1946

RCA Laboratories provides another great achievement in television—the "mirror-backed" Kinescope, or picture tube.

New "searchlight brilliance" for home television!

Now, large screen television pictures are twice as bright—yes, *twice as bright* as ever before!

You can "count every eyelash" in the close-ups. You'll almost want to shake hands with the people on your television screen—so great is the illusion that they are actually in your living room.

This new sharpness and brilliance is achieved through the new RCA "mirror-backed" Kinescope, or picture tube, perfected at RCA Laboratories.

It has a metallic film—eight-millionths of an inch thick. This metallic film acts as a reflector, allowing electrons to pass through to the screen but preventing light rays from becoming lost through the back of the tube. Just as the reflector of a searchlight concentrates its beam—so does this metallic film reflector double the brilliance and clarity of detail in home television receivers.

Similar progress-making research at RCA Laboratories is being applied constantly to all RCA Victor products—assuring you that anything you buy bearing the RCA monogram is one of the finest instruments of its kind science has achieved.

. . .

Radio Corporation of America, RCA Building, Radio City, New York 20. Listen to The RCA Victor Show, Sundays, 4:30 P.M., Eastern Time, over the NBC Network.

RCA Victor home television receivers will be available in two types. One model will have a direct-viewing screen about 6 by 8 inches. The other type will be similar to the set shown above—with a screen about 15 by 20 inches. Both instruments are being readied for the public with all possible speed and should be available this year.

RCA **RADIO CORPORATION of AMERICA**

MEDICINE

A-Bomb Effects Studied

People of Nagasaki and Hiroshima need to be studied for many years to determine long-range effects on blood, disease resistance and reproduction.

➤ THE PEOPLE of Hiroshima and Nagasaki must be followed for many years to determine the long-range results of atomic bombing on their blood, resistance to disease and ability to have normal children, Capt. Shields Warren of the Navy Medical Corps, declared at the meeting of the American Association for Cancer Research in Atlantic City.

Capt. Warren, who is president of the association, was chief medical officer of the Naval Technical Mission to Japan and his report is the first official public account of the Navy's medical investigation of the effects of the atom bombings.

"The distinctive feature of the atomic bomb is the large amount of radiant energy which it produces," he pointed out.

Its chief effects on the body are: 1. the effects of heat, producing primary injury of the flash burn type and secondary injury due to fires started by the bombing; and 2. the effects of short-wave radiation and neutrons which closely parallel the effects familiar to medical scientists from experimental studies of the effects of X-rays.

"This radiation was produced in an instant," Capt. Warren reported. Security prevented his stating the exact duration of time and the type and quantity of radiation.

The immediate effects from radiation injury as a result of atomic bomb explosions were weakness, malaise, fever and often death. These effects appeared usually within 48 hours. Capt. Warren and his group looked for the delayed effects in the blood, blood-forming tissues and sex glands, tissues known to be particularly sensitive to radiation.

Damage to the blood-forming tissues fell into three chief groups. The first was the one in which the white cells of the blood, important defenders against disease germ invasion, were greatly reduced in numbers. Infection, particularly Ludwig's angina, was the outstanding feature. The great bulk of deaths in this group occurred within the first three weeks after the bombing.

Within three to five weeks after the bombing, a considerable number of persons died of hemorrhage, the result of lack of elements in the blood necessary for clotting. This was due to radiation damage to certain cells of the bone marrow. The hemorrhages varied from extensive black and blue spots to massive bleeding from various openings of the body. Although Capt. Warren did not say so, these hemorrhages might have been what gave rise to rumors of elderly women being rejuvenated by the atomic bomb's effects.

Those with serious bone marrow damage who weathered the first few weeks developed anemia later with red blood cell counts in some dropping to as low as 1,000,000 or less, which is less than one-fourth the normal.

The atomic bombing's effects on the sex glands were much more prominent in the case of men than women, Capt. Warren reported. Changes noted in previously normal high school girls may have been due to psychic shock and malnutrition as well as to direct effect on the ovaries, he suggested. Although women of child-bearing age only occasionally showed damage to the ovaries of a kind to interfere with ability to have children, this type of damage in men was striking.

The treatment given A-bomb victims by the Japanese was "utterly inadequate," Capt. Warren found.

The number of deaths should have been materially reduced if victims had been given repeated blood transfusions and penicillin to control the infection during the period of white blood cell anemia.

On the much discussed question of danger from left-over radioactivity in the area after atomic bombing, Capt. Warren stated:

"We were fortunate in locating a number of persons who had entered the bombed areas soon after the explosion and had remained there. None showed any deleterious effects."

In other words, the area was safe for

INSECT EGGS—This photograph shows the odd way in which the lacewing fly places her eggs as a means of preventing her carnivorous offspring from eating each other. The young, called aphis lions, are so hungry when they hatch that the first one out would eat up all the eggs containing the others. So she secretes a series of stiff, silk-like stalks with her eggs attached to their ends. Then as each larva hatches out it crawls down the stem and goes away from the rest of the eggs in its search for something to eat. Aphis lions feed on plant lice, and are very valuable in keeping down these pests. Photograph by George A. Smith, of Quarryville, Pa.

humans soon after the bombing was over.

Besides the heat and radiation effects, atomic bombs also produced the blast effects of the conventional types of bombs. Survivors might suffer from flash burns, blast injury and radiation injury simultaneously. In the cities and villages around Nagasaki and Hiroshima it was easy to pick out the irradiated refugees by the characteristic flash burns and frequent baldness. Of the 80,000 who died at Hiroshima and the 45,000 who died at Nagasaki it would be very difficult to say what proportion were killed by one or another type of energy.

A very striking feature of the heat injury of the A-bomb was the speed with which it acted and passed. Clothes, wisps of hair, or even the shadow of an arm across the body were enough to protect against this kind of burn, Capt. Warren reported. He showed a picture on which the profile of blades of grass stood out in relief against the burned background of a board bunker where the intense but instantaneous radiant heat burned the wood before the grass had time to wave or wither.

"The destructive effect of the blast was centrifugal except at the hypocenter (the project of the true center on the ground) where it was essentially vertical," Capt. Warren added in a brief description of the nonmedical aspects of the A-bombing effects.

"Consequently some poles and trees stood at the hypocenter, although extensively levelled elsewhere. The importance of streamlining in resisting blast was well shown by factory smoke stacks, the great majority of which stood."

Science News Letter, March 23, 1946

ELECTRONICS

Wind-Finding Equipment

Developed during the war, it provides data on conditions in the upper atmosphere. Gives speed and direction of wind. Is known as a transponder.

➤ "Wind-finding" equipment, which provided data on conditions in the upper air vitally needed by the armed services, was developed during the war by the National Bureau of Standards, it is now revealed. Initially the project involved means for increasing the usefulness of radiosonde, which automatically transmits, by radio, data on barometric pressure, humidity and temperature from different altitudes as the balloon carrying it ascends. The Navy also wanted data on the speed and direction of the wind.

The new device is known as a transponder, the Department of Commerce says, and is also called a re-emitter because it picks up signals and re-emits them back to a receiving station on the ground. In plain English, it is a two-way radio set which operates on the principle of amplitude modulation, widely used in broadcasting. Because this device requires a rather complicated antenna which swings from one position to another, it was found impracticable for installation on fighting ships because of their constant roll.

The answer to the problem was found in the "corner cube reflector" and the "pulse repeater" which operated on ships without interfering with other equipment. The corner cube reflector operates on the same principle as the reflectors commonly found in road signs throughout the country. When a radio or radar signal strikes the corner cube reflector as it revolves under the small balloon by which it is borne aloft, it is reflected back to the ground or ship station.

Fire-control radar follows the balloon, just as it follows a plane in order to provide data for aiming anti-aircraft guns. From these data the naval meteorologist is able to trace the position of the corner cube reflector as it moves through the air and to determine the direction and speed of the wind.

The pulse repeater is a small two-way unit which receives signals or pulses and repeats them in stronger volume. In addition to providing data on wind direction and speed for weather analysis, the device has a very definite application to ballistics, supplying information on wind conditions for correction of fire-control data.

The work of the National Bureau of Standards on wind-finding equipment was sponsored and financed by the Navy, which also made available to Bureau experts the Navy's modern radar laboratory on Chesapeake Bay.

Science News Letter, March 23, 1946

ENGINEERING

Internally Cooled Piston For Explosion Engines

➤ AN INGENIOUS idea for an internally cooled piston for heavy-duty explosion engines is embodied in patent 2,396,500, obtained by Walter Gasser of El Cerrito, Calif. The upper end of the hollow connecting rod is expanded into a large sphere, around which a collar-like piston fits, ball-and-socket fashion. The top of the sphere thus constitutes the piston head. Oil is forced up through the hollow connecting rod in a cooling jet against this hot surface. Rights in the patent are assigned to the Shell Development Company.

Science News Letter, March 23, 1946

SCIENCE NEWS LETTER
Vol. 49 **MARCH 23, 1946** *No. 12*

The weekly summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St. N. W., Washington 6, D. C. NOrth 2255. Edited by WATSON DAVIS.

Subscriptions—$5.00 a year; two years $8.00; 15 cents a copy. Back numbers more than six months old, if still available, 25 cents.

Copyright, 1945, by Science Service, Inc. Republication of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service.

Entered as second class matter at the post office at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566 and 360 N. Michigan Ave., Chicago STAte 4439.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: Edwin G. Conklin, American Philosophical Society; Otis W. Caldwell, Boyce Thompson Institute for Plant Research. ***Nominated by the National Academy of Sciences:*** Harlow Shapley, Harvard College Observatory; Warren H. Lewis, Wistar Institute; R. A. Millikan, California Institute of Technology. ***Nominated by the National Research Council:*** C. G. Abbot, Smithsonian Institution; Hugh S. Taylor, Princeton University. Ross G. Harrison, Yale University. ***Nominated by the Journalistic Profession:*** A. H. Kirchhofer, Buffalo Evening News; Neil H. Swanson, Executive Editor, Sun Papers; O. W. Riegel, Washington and Lee School of Journalism. ***Nominated by the E. W. Scripps Estate:*** Max B. Cook, Scripps Howard Newspapers; H. L. Smithton, Executive Agent of E. W. Scripps Trust; Frank R. Ford, Evansville Press.

Officers—President: Harlow Shapley. ***Vice President and Chairman of Executive Committee:*** C. G. Abbot. ***Treasurer:*** Frank R. Ford. ***Secretary:*** Watson Davis.

Staff—Director: Watson Davis. ***Writers:*** Frank Thone, Jane Stafford, Marjorie Van de Water, A. C. Monahan, Martha G. Morrow. ***Science Clubs of America:*** Joseph H. Kraus, Margaret E. Patterson. ***Photography:*** Fremont Davis. ***Sales and Advertising:*** Hallie Jenkins. ***Production:*** Dorothy Reynolds.

MEDICINE

Glaucoma Weapon

Chemical that failed as war gas may help those with the blinding eye disease and may lead to better understanding of myasthenia gravis.

➤ A CHEMICAL that failed as a war gas nevertheless held the spotlight at the meetings of the Federation of American Societies for Experimental Biology in Atlantic City. The reason: Trials on patients show that it may help those with the blinding eye disease, glaucoma, and may lead to better understanding of and treatment for the muscle weakness disease, myasthenia gravis, and perhaps other ailments involving nerve and muscle chemistry.

In more than a score of patients with glaucoma, who had not been helped by physostigmine or pilocarpine, the usual medicines for this disease, the war gas chemical kept tension in the eyes normal and prevented further loss of visual fields, Dr. Irving H. Leopold and Dr. Julius H. Comroe, Jr., of the University of Pennsylvania School of Medicine, reported.

The chemical is di-isopropyl fluorophosphate, called DFP for short. Early in the war British chemists explored its action because its effect in contracting the pupils of the eyes led them to hope it might interfere with enemy marksmanship. This proved a false lead, but when scientists in our own Chemical Warfare Service at Edgewood Arsenal studied DFP they learned facts about its effects on body chemistry which led them to ask doctors at certain medical centers to try its value for patients.

Some of the 76 glaucoma-affected eyes were not helped by DFP or any other medicine. This occurred in 16 instances. In another 24, DFP gave the same results as the two medicines commonly used for this eye ailment. But 36 eyes were helped by DFP when other medicines failed.

DFP has a much longer lasting action than pilocarpine or physostigmine. These drugs have to be dropped into the eyes three to six times every day, but in only 10 cases was it necessary to use DFP more than once a day. Once a day was enough for the majority, while in one case DFP was needed only every 10 days.

Undesired effects reported for DFP were blurring of eyesight, brow and eyeache, spasm of accommodation and peripheral vasodilation.

DFP is not the final answer for myasthenia gravis patients, it appears from the report of its trial in seven patients by Drs. Julius H. Comroe, Jr., John Todd, and George Gammon and Lt. George B. Koelle and Maj. Alfred Gilman. These scientists, at the University of Pennsylvania and Edgewood Arsenal, also examined the effects of DFP on the blood, liver and kidneys of 20 normal persons. No changes in liver, kidney or blood-forming functions were found, the most frequent undesired effects being on the stomach and intestines.

DFP relieved the weakness of the myasthenia gravis patients for longer periods than did neostigmine, the usual drug for this ailment, but never to the same degree. Muscle power was only partially improved by DFP, but markedly increased by neostigmine.

With DFP's effects on body chemistry as a guide, however, scientists may be able to develop a more effective chemical than any yet known for treatment of myasthenia gravis.

In studies of its effects on the body generally, DFP was given by injection into the muscles or by capsules that were swallowed. When dropped into the eyes for glaucoma treatment, however, very little if any of it is absorbed by the body.

Science News Letter, March 23, 1946

MEDICINE

Electric Knife Now Used For Chest Surgery

➤ SURGEONS may now use the superior electric knife for the first time in chest operations as a result of a new anesthesia technique developed at the University of California Medical School. A general improvement in such operations is expected from the development.

In the new technique curare is used to paralyze the respiratory muscles and nitrous oxide to put the patient to sleep. This eliminates the use of the explosive anesthetics which are ordinarily used and which preclude electric cautery.

The doctors explained that it is necessary in a chest operation to use an anesthetic which is potent enough not only to put the patient to sleep but to paralyze the respiratory muscles so that breathing can be controlled by gentle pressure on a breathing bag attached to the mouth.

The explosive anesthetics, such as ether and cyclopropane, have been the only ones potent enough to accomplish both these purposes. The electric knife would cause an explosion on contact with these gases within the lung.

A combination of nitrous oxide and curare is desirable because no bad after effects have been noted. The gas is potent enough barely to put the patient to sleep, and the curare is strong enough for paralysis of the respiratory muscles.

The doctors have found the technique safe to use over the long periods of time —six hours is not unusual—required for a chest operation. It is especially advantageous when young doctors are operating; it puts them at their ease, they can work without pressure. Sixty-eight chest operations have been performed using the technique.

ON LOAN—A Coast Guardsman examines an old-style lighthouse lens. Schools, museums, and maritime societies may borrow this lens and many other old lenses from the Coast Guard. Because of the change from oil to electricity, other scientific improvements and modern designing, these old lenses, still in excellent condition, have been retired from active service.

The use of an electric knife in chest surgery is desirable because it congeals the blood quickly around incisions and prevents excessive bleeding in vital areas of the body.

"The cautery has been used within the chest cavity in every case," the doctors reported recently. "It has proven easy to produce apnea (paralysis of respiratory muscles) and control breathing, and no difficulty has been encountered on any case in persuading the patient to resume spontaneous respiration.

"The patient's general condition during the operation and postoperative course has been excellent in all cases."

Science News Letter, March 23, 1946

ENGINEERING

Icy Waters Patrolled

Radar, loran and aviation will play part in North Atlantic iceberg patrol now being re-established as international service.

See Front Cover

➤ WAR-DEVELOPED radar and loran, as well as aviation, will for the first time play important parts in patrolling the North Atlantic for icebergs in shipping lanes, as shown on the cover of this SCIENCE NEWS LETTER, in the re-established International Ice Patrol, the U. S. Coast Guard announces. The service was discontinued Dec. 22, 1941, because of the disruption of normal maritime commerce, although a careful estimate of North Atlantic ice conditions was maintained throughout the war for the benefit of naval vessels and convoys.

The danger season in the North Atlantic from icebergs in the waters patrolled by the U. S. Coast Guard extends each year from March or April to July. The patrol area covers a region about the size of the state of Pennsylvania in the general region of the Grand Banks of Newfoundland, a section blanketed in fog during a large part of the time. The fog is aggravated by the meeting of the Gulf Stream and the Labrador current. Through the region passes the world's heaviest ocean traffic, Coast Guard officials state.

A constant patrol of the region will be maintained by aircraft and especially equipped cutters. Airplanes of the B-24 type will be used by the aerial watch. The 254-foot cutters are powerful vessels, equipped for rescue at sea and for ice-breaking, and having other essential mechanical and electrical apparatus. Both planes and cutters are equipped with radar and loran.

The radar will assist in locating icebergs during low visibility. Loran will give the exact location of a berg as soon as discovered. This is important. In the past, patrol vessels have been fogbound for days. Their position had to be determined by dead-reckoning and radio direction finder bearings. With the use of loran, the patrol vessel's position can be determined within approximately one mile and warning given of the position of an iceberg sighted. Loran will also afford a more efficient means of tracking bergs in their daily movements.

Science News Letter, March 23, 1946

MEDICINE

Great Germ Killers To Be Useless Soon

➤ PENICILLIN and streptomycin will be useless as remedies against disease within five to ten years, Dr. Hans Molitor, of the Merck Institute for Therapeutic Research, predicted at the meeting in Atlantic City of the Federation of American Societies for Experimental Biology.

New antibiotics will then be needed for patients with pneumonia, streptococcus infections and the like, unless some chemist can synthesize penicillin and then change it enough to make it continually useful.

The reason the two great antibiotics we now have are destined for the scrap heap of worn-out remedies in a few years is that germs are developing resistance to these chemicals. Doctors may have to give a thousand times as much of these antibiotics and give it faster to get the patient well, Dr. Molitor predicted.

One thing that can be done to stave off the day of uselessness for penicillin and streptomycin is to refrain from giving them to any patient unless really necessary. Use of penicillin in lozenges, salves, tablets and the like from which the patient gets only small quantities of the mold chemical or use in diseases it does not remedy, such as influenza, will hasten the day of penicillin's uselessness.

When penicillin or streptomycin are used, they should be given in large enough doses to kill the disease germs in a few days, before they can get used to the antibiotic and grow resistant to it.

A new idea of dosage of drugs has developed through penicillin and streptomycin, Dr. Molitor said. Formerly a doctor might look up in a textbook the average dose of a medicine for a certain disease and give that to his patient. With the antibiotics he first must determine what germ is causing the trouble and then adjust the dose in each case to give a sufficient concentration of the antibiotic in the patient's blood to kill the germs.

Science News Letter, March 23, 1946

MEDICINE

Prevention of Water On Brain by Diet Hinted

➤ THE TRAGEDY of a baby born with hydrocephalus, or water on the brain as it is popularly known, may be prevented in future by diet, is the hint in studies reported by Dr. R. L. Richardson and Dr. A. G. Hogan, of the University of Missouri, at the meeting of the Federation of American Societies for Experimental Biology in Atlantic City.

Infants born with this condition can be recognized by their very large heads. Usually they are retarded mentally and few survive to adulthood.

The cause of the condition, the Missouri scientists report, may be an inadequate diet of the mothers before the babies are born. The vitamin or other food chemical, lack of which might lead to this condition, is not known but apparently is contained in liver.

When an eluate of a fuller's earth absorbate of a liver extract was added to the diet of 54 female rats, a total of 1,020 young survived until they were weaned and several thousand young were reared in the stock colony with no sign of hydrocephalus, the scientists reported. A group of 230 female rats fed the same diet but lacking the liver material had 1,756 young which survived at the weaning age of 28 days, but there were in addition 30 which developed hydrocephalus between the ages of 10 and 24 days. Of these 30, only two survived as long as 28 days.

Science News Letter, March 23, 1946

Flue-cured *tobacco leaf* accounts for more than half the American crop and is used mainly in cigarettes.

PHYSIOLOGY

Bathtubs in the Sky

Pilots would be much less likely to blackout if they could sit in a tub full of water while doing fast turns and other evasive maneuvers.

➤ IF THE PILOT of a fighter plane could sit in a bathtub full of water while he was doing fast turns, loops and other evasive maneuvers, he would be much less likely to blackout, Drs. C. F. Code, E. H. Wood and E. J. Baldes, of the Mayo Aero Medical Unit, told physiologists at the first session of the Federation of American Societies for Experimental Biology in Atlantic City.

Sitting in a specially constructed bathtub built into a cockpit, men were spun around on a human centrifuge to test the effects of immersion in water as protection against blackout. The men sat in exactly the same position that they would have to assume if they were in a plane dodging the enemy in fast maneuvers.

First tests were made sitting in the tub without water. Later, water was added to various body levels.

On the average, with water up to just below the breast bone, the men were protected against the effects of acceleration to an amount expressed as 0.9 g. When the water level was raised to the level of the third rib, the protection was 1.7 g, which is comparable with the protection given by the special anti-blackout suits.

Presumably, the water in this sky bath should not be hot or even pleasantly warm, because these same investigators, working with another colleague, Dr. E. H. Lambert, found that warm, humid surroundings lower tolerance for sudden changes of direction and speed.

Based on tests conducted on the human centrifuge, it was concluded that at a temperature of 89 degrees Fahrenheit and 77% relative humidity, tolerance was reduced as much as 0.7 g from what it is at 63 degrees F., 72% relative humidity.

Another way of protecting the pilot against blackout may be to give him a full meal or a couple of quarts of milk or water before he takes off. Drs. William G. Clark and Helen Jorgenson, of the Department of Aviation Medicine, University of Southern California, reported to the same session that a heavy meal increased tolerance to positive acceleration although only slightly. Drinking about two quarts of liquid (1.5 to 2.0 liters) was more effective, giving a 0.2 g protection at an acceleration three to four times that due to gravity, but this is considerably less than that afforded by the pressurized abdominal belts in anti-blackout suits.

Effects on Brain

➤ AIRPLANE pilots who fly at high altitudes all day, and day after day, may expect no ill effects on their brain cells unless they go frequently to altitudes of 30,000 feet or more, provided experiments conducted on guinea pigs may be considered as applying to man.

In the experiments reported by Drs. W. F. Windle and A. V. Jensen of the Institute of Neurology, Northwestern University Medical School, animals were placed under atmospheric pressure equivalent to that of 23,000 feet altitude for six hours daily and six days a week until the guinea pigs had run up as much as 500 "flight hours."

Sections of the brain were then examined under the microscope. No evidence was found of hemorrhages or blood vessel changes. No alterations in nerve cells were found, or reduction in their number.

Other guinea pigs were given 100 hours at 23,000 feet and then another 100 hours at 30,000 feet. Although these animals showed no outward sign of brain injury, some areas of softening due to brain anemia were found. No hemorrhages were found in the brains of these "stratosphere flyers" and no generalized condition of abnormality in the brain.

Speed of Blood Flow

➤ WHEN YOU ARE RESTING, blood flows through your brain at the rate of about 10,000 drops per minute, the same session learned from a report by Drs. Frederic A. Gibbs, Harry P. Maxwell, Erna L. Gibbs, and Ruth E. Hurwitz, of the University of Illinois College of Medicine.

If you breathe deeply and rapidly, as the flyers do who are suffering from lack of oxygen, the blood flow will invariably be slowed down. If you breathe a high concentration of carbon dioxide the flow will be speeded up.

The Illinois investigators clocked the flow of blood through the brain by an ingenious method. A two-tenths per cent solution of a dye called Evans Blue was injected at a regular rate into the right internal carotid artery in the neck. Blood samples were then taken from the right jugular vein with and without shutting off the right internal jugular vein and from the femoral artery in the thigh. The difference in concentration of the dye in the blood from the arteries and from the vein gave the information for estimating the blood flow through the brain.

With this information and the difference between the venous and arterial samples in oxygen it is also possible to estimate oxygen consumption.

Science News Letter, March 23, 1946

VETERINARY MEDICINE

Buffalo Disease Traced to Filterable Virus

➤ A DISEASE that kills large numbers of water buffalo, most important farm work animals of the warm lands of southeastern Asia, has been identified as an encephalitis with a filterable virus as its cause, by Dr. T. S. Sheng of the National Central University at Chengtu, China. (*Science,* Mar. 15)

Chinese farmers call the disease "szegiao-han", which means "four-legs-cold". This comes from the two most noticeable symptoms: when an animal is stricken, its owner finds it in the morning with its four legs stretched out stiff, and cold to the touch. Shortly afterwards it dies; Dr. Sheng states that 95% of all cases end fatally. No treatment is known, and no method of prevention.

Although the malady is so highly fatal to the animals, it seems to have no terrors for human beings. Dr. Sheng and his assistants worked freely among sick animals in the field, and dissected their brains in the laboratory, without even wearing rubber gloves. He adds that in all the cases he has encountered, no human being associated with the dying animals has ever contracted the malady.

Dr. Sheng proved the encephalitis to be due to a filterable virus by grinding up diseased brain and nerve tissue taken from dead animals and passing the extract through a germ-stopping filter. The filtrate was able to produce the disease in buffalo, goats and guinea pigs. Attempts to propagate the virus on incubated eggs were not successful.

Science News Letter, March 23, 1946

AERONAUTICS

B-50 Superfortress Surpasses B-29

➤ A MORE powerful Boeing Superfortress, a counterpart of the famous B-29 but having increased power and improved flight performance, has been announced by officials of the Army Air Technical Service Command. An experimental model has passed flight tests, and the production version is now being built by Boeing Aircraft at Seattle. It will be known as the B-50, Superfortress, or the XB-44.

In addition to the increase in horsepower over the B-29, a new-type nacelle has been designed for the XB-44 which enables a change of engine units to be made by six men in a half hour. It takes six men eight hours to do the same job in the wartime B-29. The new nacelle contains the engine, supercharger, induction system, oil system and propeller controls.

The new superfortress is powered by four R-4360 Pratt and Whitney engines, with a total of 12,000 horsepower. The increase in horsepower over the B-29 comes from the change in the engine installation. The large increase in the available power provides a marked improvement in take-off, rate of climb and speed, Army officials state. A four-bladed Curtiss Electric propeller, which has the reversible pitch feature for braking, replaces the previous propeller.

Science News Letter, March 23, 1946

HERPETOLOGY

Snake Lays Eggs After Four Years of Confinement

➤ SEVERAL EGGS, at least one of which was fertile, were laid by a snake after living almost four and a half years in solitary confinement, states Hampton L. Carson of the department of zoology, Washington University, St. Louis.

An adult female indigo snake five feet eight inches long was purchased by Mr. Carson in January, 1941, and kept completely isolated from all other snakes. Although the snake fed heavily on amphibians, reptiles, birds and mammals, she did not grow perceptibly during captivity.

In May, four years and four months after it came into his possession, the snake laid five eggs. They all appeared normal, with turgid, leathery shells.

The eggs were searched for embryos by cutting circular holes at one end and expelling the yolk of each into a finger bowl. The first two were examined half-heartedly as Mr. Carson really did not expect to find anything. The third, however, revealed a small embryo about a fifth of an inch long. The embryo seemed normal in every way. No embryos were found in the two remaining eggs.

This is probably an extreme case of delayed fertilization, the sperm having been stored in the genital tract of the female for at least four years and four months, Mr. Carson states. The conditions under which the snake was kept during the spring of 1945 differ in no way from those of the four previous springs and there is no obvious explanation of the failure of the snake to lay eggs during the first four years of captivity.

Several other cases of sperm storage by female snakes have been reported during the last decade or two, and Mr. Carson suggests in a report to the American Society of Ichthyologists and Herpetologists that this phenomenon may exist widely in snakes.

Some species which do not have gregarious habits, for instance, should benefit particularly from the capacity to store sperm. The three snakes known to store sperm are all warm-climate species that lack the gregarious habits of hibernation characteristics of certain northern snakes and thus have less chance of finding a mate each year.

Science News Letter, March 23, 1946

ORDNANCE

Rate of Fire Speeded Up In .50-Caliber Machine Gun

➤ THE .50-CALIBER machine gun, chief reliance of American flyers in their air fights during the recent war, has had its rate of fire stepped up by 50%, it is disclosed by Col. René R. Studler. (*Army Ordnance*, Mar.-April.)

The improved weapon can reach a rate of 1,250 rounds a minute, as compared with a maximum of 850 for the wartime model. Of course, no machine gun is fired continuously for as much as a minute. But if all 14 forward-bearing guns on a B-25 were to be fired in a combined, one-second burst, they would hurl 280 two-ounce slugs at the enemy during that short period, Col. Studler points out.

The new piece is only one and one-half pounds heavier than its predecessor. Improved metals and at least 10 distinct technical improvements account for its radically heightened performance.

Science News Letter, March 23, 1946

IN SCIEN

CHEMISTRY

New Method to Take Pure Oxygen from Air

➤ PURE OXYGEN can be obtained from the air by a relatively simple process developed during the war that uses synthetic chemicals and works on the same principle by which the blood in the human body takes oxygen from the air in the lungs and transports it to the tissues. The new method was explained recently at a meeting of the California Section of the American Chemical Society by Dr. Melvin Calvin of the University of California.

It was observation of this human process and similar natural processes, according to Dr. Calvin, that enabled scientists to evolve the new synthetic method of oxygen preparation, which, he said, was first used in the South Pacific to produce oxygen needed for welding and other repair work away from regular repair bases.

The process employs an entirely new group of chemicals which belong to a class of compounds called chelates. These are made up of metal atoms attached to organic molecules, he explained, the latter usually composed of carbon, hydrogen, nitrogen and oxygen. Nature has long utilized chemicals of this type for the essential use and generation of oxygen by animals and plants, such as the green chlorophyll of plants and the hematin that gives the red color to blood, he said.

In the new process, one of these chemicals, in the form of red crystalline granules, is placed in a tube and a stream of air is blown through it, he explained. "As the red granules absorb the oxygen, they turn black and begin to get warm. As they warm up, the rate of oxygen absorption decreases and the total amount of oxygen which they can absorb is decreased, therefore, the tube is cooled by a stream of water around the outside."

After the crystals have absorbed all the oxygen they can, the stream of air is stopped and the cold water surrounding the tube is replaced with hot water or steam, he continued. As the crystals are warmed, they give off the oxygen and again become red. The oxygen may be collected in a storage tank, and the crystals may be reused thousands of times.

Science News Letter, March 23, 1946

NE FIELDS

PHYSIOLOGY

Drugs That Fluoresce Traced Through the Body

➤ DRUGS that fluoresce, or shine with a glow of their own under invisible ultraviolet radiation, can be traced by this means in their course through the body, Dr. Charles H. Taft of the University of Texas Medical Branch states. (*Science*, Mar. 15)

Dr. Taft chose a quinine derivative, quitenine, because of its intensely purple fluorescence. He injected it under the skin of a considerable number of toadfish, and each day killed and dissected a fish, exposing its internal organs to ultraviolet radiation. He found that the drug, at first rather generally distributed throughout the body, presently concentrated most strongly in the liver, and to some extent also in the kidneys.

Dr. Taft states that he is continuing his work on the use of ultraviolet rays as a physiological tracer method.

Science News Letter, March 23, 1946

CHEMISTRY

Protection from A-Bomb Radiations Suggested

➤ GLASS to protect against deadly radiations from exploded atomic bombs was suggested at a section meeting of the American Chemical Society in Detroit, by Prof. Alexander Silverman, head of the chemistry department of the University of Pittsburgh. The glass recommended is not the ordinary kind, but has a high lead and uranium content, and would be suitable for lining shelters.

"Strange as it may seem," he said, "uranium, which is used indirectly in atomic bomb manufacture, produces a glass which is probably the best protection we have against powerful X-rays and other harmful radiations. In post-bombing rescue work, uranium or lead spun-glass garments and helmets lined with these glasses in plate form will permit safe entry into the bombed area. Oxygen respirators will be equipped with glass-insulated high-frequency precipitators to keep radioactive dust out of the lungs of the rescue squads."

Prof. Silverman called attention to many new types of glass, and many new uses for them. Optical glass researches, he said, have yielded new products to transmit or absorb radiation of all kinds, noting that reflection and transmission controls make it possible for binoculars to transmit 60% more light than they did before the war. He also mentioned a new treatment for mirrors that permits a person to see himself in the reflecting surface and at the same time makes him visible through the glass to a person behind the mirror.

Fiber glass and foam glass will have wider uses in the future, Prof. Silverman indicated. "The heat-insulating value of the former will be utilized more extensively than ever in outdoor clothing and automobile and other vehicle insulation. The reinforcing strength of glass fibers will serve in a host of postwar plastic articles," he declared.

Science News Letter, March 23, 1946

AERONAUTICS-ENGINEERING

Heating and Ventilating Problems Face Aviation

➤ HEATING and ventilating passenger airliners, particularly those designed for operation at 15,000 feet and over, is a problem on which aviation engineers are now concentrating because of anticipated increased travel by air and the use of high-altitude airlanes.

Development has already reached a point astonishing to the land engineer, B. M. Brod, of American Airlines, told a meeting of the American Society of Heating and Ventilating Engineers in New York, but, he said "the end is not yet, for pressurizing of cabins has raised many problems, some of which are not even as yet recognized."

Heating systems for air transports flying at 15,000-foot altitudes are designed for an outside temperature of 40 degrees below zero, he said. Operation at 20,000 feet, anticipated shortly, will require a design temperature of 60 degrees below zero. Loss of cabin heat is large because of the thin walls.

Three types of heating systems were described by Mr. Brod. One is the steam system, in which heat from the exhaust is used in a flash-steam boiler; the second makes use of exhaust heat in a heat exchanger in the ventilating air stream; the third is a gasoline-burning heater.

The first system, he stated, is safe but heavy, and requires excessive maintenance; the second is simple and reliable but needs frequent checking; and the third is efficient, light and flexible, but has short life, high maintenance, and requires piping of gasoline to the heater.

Science News Letter, March 23, 1946

ENGINEERING

Gas Turbine Engines May Power Ocean Liners

➤ GIANT GAS TURBINE engines may soon be used to power ocean liners and war vessels, following their present successful use in the propulsion of airplanes. They may also be used in locomotives and in central power stations. These predictions were made by John R. Carlson, Westinghouse engineer, at a meeting of the Washington branch of the Society of Automotive Engineers.

Before gas turbines can be used in vessels, a reversible-pitch propeller will have to be perfected to facilitate moving a ship forward and backward, he stated:

"Ships now propelled by steam turbines don't need this type of propeller because they are equipped with a reversing element for running astern. In forward operation, this reverse element, which is mounted on the same shaft as that which propels the ship forward, spins backward while idling. It doesn't absorb much power while rotating because that section turns in a vacuum."

"But the gas turbine," he said, "can't be built in such a way that its reverse element will turn in a vacuum, but must revolve in air of approximately atmospheric density, and thus sets up turbulence and resistance resulting in greater fuel consumption and higher operating costs. There is every reason to believe, however, that this problem will in time be solved."

Chief advantages of the gas turbine, Mr. Carlson stated, lie in its simplicity of design and operation, its compactness and relatively light weight. Progress in its development was delayed for a long time, he added, by the fact that there were no metals known that would withstand the combination of high temperature and tremendous mechanical forces necessary for such turbines to operate at high efficiency. Wartime-developed alloys now meet this requirement, and the way is cleared for greater advancement along other lines.

"Widespread use of the gas turbine as a central station power plant is foreseen only when the higher thermal efficiency at higher temperatures of which it is capable, as compared with that of a steam turbine, justifies the added fuel cost," he continued. "At temperatures above about 1,000 degrees, steam turbines rapidly fall off in efficiency, but gas turbines continue to increase in efficiency as operating temperatures rise."

Science News Letter, March 23, 1946

ENGINEERING

Assembly-Line Homes

Prefabricated houses are now mass-produced like wartime ships and planes. Construction engineers believe this type may soon dominate the smaller-home field.

By A. C. MONAHAN

► THE FACTORY mass-production methods that so successfully produced giant airplanes, ships and fighting tanks for war are now turning out ready-made homes in increasing numbers for veterans and other home-lovers. This type of house, many construction engineers believe, will perhaps soon dominate the smaller-home field and largely replace the conventional on-the-spot constructed house.

Prefabricated homes, they are called. Many were in use long before the war, but additional thousands were erected during the war to house workers in war industries and servicemen at or near camps. The public now knows what factory-built homes are. Also the public now has faith in mass-production methods because during the war people learned their value in the rapid and efficient production of war goods.

The public seems to be in a frame of mind to think that these methods can be applied in the building industry to help meet the present pressing need for more homes. Industrialists are of the same mind, too, for many additional companies have entered the prefabricated homes field. Factory buildings where wartime equipment was made are now, in certain cases, being converted for the construction of peacetime homes.

Prefabricated homes, which are shipped in sections to the sites where they will be erected, are not necessarily built entirely in the same plant. Various sections can be made in different parts of the country near the sources of materials to be used; but they are precision-made, so that they fit the sections made elsewhere.

A metal roof, for example, can be made in a metal-working region to fit a building of wood made where timber abounds. During the war large sections of ocean vessels were fabricated far inland and shipped and assembled in shipyards on the coast. Shipyards were largely assembly plants.

Prefabricated homes of the present should not be confused with the ready-cut homes of the past. There will probably always be a place for both. The ready-cut house is erected on the spot with lumber and other material cut to exact dimensions by machinery in the factory. The prefabricated type is built in sections which, at the erection site, are quickly put together permanently with the help of bolts and other fastening devices.

Come in Sections

These sections may be an entire sidewall, end wall, half roof or interior partition in a single piece for a very small house, but usually each is made up of several pieces to be joined on the job. Even plumbing, heating, kitchen and similar equipment is fabricated in the factory, and shipped to the site with the sections of the building itself, ready to be set in place and connected by simple joining devices.

The erection of a completely prefabricated home is a matter of but a few days after the foundation has been laid and outside connections for water, gas, electricity installed exactly where required. The heating, kitchen and bathroom sets can be installed and used before the roof is on the house.

The erection of homes of factory-prefabricated parts is not a new idea. Thousands of such homes were in use long before the war. A well-established industry had been organized, but it greatly expanded to meet war needs, and now is expanding again.

Some of these companies made what was known as removable or sectional buildings. They were built particularly for movable schools, temporary churches, assembly halls and other one-room structures. When no longer needed at one site they could be unbolted and moved elsewhere. Thousands were used in city schoolyards to care for overflow school attendance.

The American prefabricated homes industry is now so well established, and includes so many different manufacturers, that a monthly journal is published in its interests. The journal is not only a "booster" for the industry but a source of information for architects, builders and the public about newer developments in factory-built homes.

War-developed building materials, and others developed during recent years, lend themselves to the prefabrication of houses particularly because of their lightness and strength, and are contributing to the present boom in this type of construction. Included are giant slabs of laminated wood large enough for a one-piece sidewall, new fiberboards, plastics, glass, cement composition ingredients, and the light metals now available and usable because of improvements in the art of welding. Metal houses are popular with many.

The lightness of these materials is an important factor in the construction of sections that must be shipped and handled in transportation and during erection. Lightness alone would be of little value unless strength is combined with it. Many of the newer materials have both, and also have other properties essential in home building, such as heat insulation, and resistance to deterioration from weather, corrosion, fire and vermin.

Laminated wood is of especial interest. Plywood has been used for years for many purposes, but the development of new resins and glues for bonding the thin sheets of wood together, and of an efficient electronic heating method to set the adhesives, makes it now possible to build up boards and beams of almost any size, thickness and shape. These laminated woods may be used for outside walls exposed to the weather.

A recently developed featherweight material of great strength promises to make a substantial contribution to the prefabricated industry. It is a "sandwich" board with a "honeycomb" of cloth or paper between, and firmly bonded to two thin sheets of wood, or between sheets of aluminum, stainless steel or plastics. A practical method of bonding the sheets to the wrinkled honeycomb makes the new material possible. It is claimed to have far greater strength than anything of the same weight now being manufactured.

Nylon hosiery and transparent raincoats are well-known uses of plastics, but far more important, perhaps, are the plastic building materials, even though these are less familiar. There is now a plastic suitable for almost every household

DEMOUNTABLE—Complete roof panels can be placed or removed from a prefabricated demountable house such as the one of the National Housing Agency shown here.

use, including faucets for the water system, inside partitions, outside walls, roofing, and transparent materials to replace ordinary window panes. Some have practically every property required in building and are light in weight as well.

A glass fiber-reinforced plastic deserves particular mention because, in addition to great strength, it can be formed into large pieces of various shapes by powered presses. The manufacturers suggest its use in one-piece rowboats, or as the whole top of a railroad car. The glass fiber reinforcing gives its strength just as steel rods reinforce concrete.

While many of the prefabricated homes shown in catalogs are box-like structures, the greater demand will probably be for those of more conventional appearance, perhaps of the favorite Cape Cod type. A house is not a home to many Americans if it varies too far from the familiar structure. The box-type prefabricated home is economical to build. It fits in well with surroundings in some parts of the country, but a house with the familiar pitched roof is still the favorite.

Something very unusual as a modern home is under development in one of the great war aircraft factories, but it has not yet reached the stage of perfection which warrants advertising. Economy will be its strongest sales point, it is claimed. The sales price may be only 50% to 60% that of prefabricated homes of conventional types.

This house, the Dymaxion, it is called, is round in shape, with a domed roof. It is made of aluminum and has a window of a transparent plastic running in a strip all the way around it. Insulation will keep the inside warm in winter and cool in summer. Ventilation is provided by means of the domed top. It is a two-bedroom affair, with two baths, and will have the so-called unit equipment in its kitchen and bathroom.

Built-in furnishings seem to feature most of the new prefabricated homes. They include heating units, kitchen units, bathroom and laundry units, closets, bookcases, and even beds that store away in the walls during the day.

Typical is a kitchen unit mounted on a base less than eight feet long and narrow enough to be rolled through a door. When set in place, it is fastened to the wall. A few turns of a stillson wrench connects it to the utility outlets, and it is ready for use. It contains a stove, refrigerator, sink, work table and, overhead, cabinets for kitchen utensils. It is the modern prefabricated kitchen for the modern prefabricated home.

Science News Letter, March 23, 1946

PHYSICS

Atomic Scientist Warns Against Misinterpretation

➤ WARNING AGAINST misinterpretation of the experimental atomic bombing of Navy ships at Bikini atoll this spring and summer, Dr. Norris E. Bradbury, director of the Los Alamos Laboratory of the Manhattan Engineer District, said, "The test is not designed to determine conclusively the extent or character of our future naval construction, or to detract from the already fearful potentiality of the bomb as it might be used in another war."

Fearing that too much emphasis has been placed on the number of ships to be used in the operation, Dr. Bradbury explained that many of the ships used will not receive serious damage.

"Many are to carry important instruments which will record data necessary to interpret properly the results of the test," he pointed out.

"The aim of the test," he declared, "should not be to see how many ships can be destroyed and sunk, but to obtain objective and factual information from ships at varying distances with all degrees of damage."

Dr. Bradbury said two difficulties in the test will be the danger of fires that might normally be put out by personnel aboard a ship, and the fact that the ships will be closer together than in a tactical formation.

The atomic scientist warned against misinterpretation of the results of the bombing damage, pointing out that the important effects of radioactivity and radiation can only be determined by technical measurements.

"Only by the most careful, unbiased and technical interpretation in military and naval circles, in the offices of overall military strategy and in the public press can the test be given its proper weight and meaning," declared Dr. Bradbury.

"Nor," he added, "should the people of this country ever forget the appearance of Hiroshima and Nagasaki after only one atomic bomb."

Science News Letter, March 23, 1946

Approximately 50 American *agricultural crops* depend upon honeybees for pollination.

Spectrographs, which determine elements in kind and amount by measuring ultraviolet ray lengths, have been found particularly useful in plant and poison analysis by agricultural chemists; samples are burned to emit the rays.

ANYONE CAN USE A SLIDE RULE

Absolutely no math background needed if you have the PRACTICAL SLIDE RULE MANUAL by J. M. Klock, formerly mathematician for the U. S. Navy and instructor in the Detroit Public Evening Schools. An absolutely non-technical explanation of how to use a slide rule for the fundamental math calculations. A necessity for students of all math and science, technicians, shop men, engineers, etc. Also includes work on cost accounting, interest rates, and other business applications.

NOTICE: ORDER YOUR MANUAL NOW AS ALL PRINTINGS THIS SUMMER WILL BE SOLD EXCLUSIVELY TO LIBRARIES. WE CANNOT GUARANTEE TO FILL ORDERS RECEIVED AFTER MAY 28, 1946 UNTIL FALL.

Large illustrations. Simple and non-technical explanations. Based on 9 terms of teaching adults. With this booklet anyone who knows the simplest arithmetic can easily learn the slide rule. Starts from a simple reading of the scales, and goes on through the most advanced practical work, with applications to formulae from mathematics, engineering, aeronautics, air navigation, etc. Booklets are sent postpaid by return mail. Send $1.00 to

SLIDE RULE • BOX 2293 • DETROIT 31, MICHIGAN

Do You Know?

The largest number of *colds* occurs in the 20 to 29 year age group.

Raw silk was produced in Virginia in 1622.

Bees sometimes rob honey from other hives rather than hunt for nectar.

Oysters may pass as much as 50 gallons of water through their gills in a day, though the amount is usually nearer 10 gallons.

Gasoline is not one chemical compound but comprises many different hydrocarbons; their nature and amount determine the behavior of the fuel in an engine.

The *white-fringed beetle* of South America, introduced into Florida in 1936, has become a menace to peanuts, yams, cotton, and other plants in Louisiana, Mississippi, Alabama.

The *puff adder*, a common snake in America, is one of the world's biggest bluffers; when cornered it spreads its head cobra-fashion, or opens its mouth as if to strike, which it sometimes does —but with its mouth closed.

YOUR HAIR and Its Care

By Oscar L. Levin, M.D. and Howard T. Behrman, M.D.

NEW, REVISED, EXPANDED EDITION—JUST OUT!

If you want healthy hair, lovely hair, then you need the expert advice in this book.

Two medical specialists have here pooled their knowledge to give you in plain language the up-to-date scientific facts now available about hair. They tell you what to do to save and beautify your hair, stimulate healthier hair growth, and deal with many problems, common and uncommon, as:

Dandruff—gray hair—thinning hair—care of the scalp—baldness—abnormal types of hair—excessive oiliness—brittle dryness—hair falling out—infection —parasites—hair hygiene, etc., etc.

Medical science is better equipped today than ever before to prevent trouble above the hair line; or, should some difficulty already have arisen, to deal effectively with it.

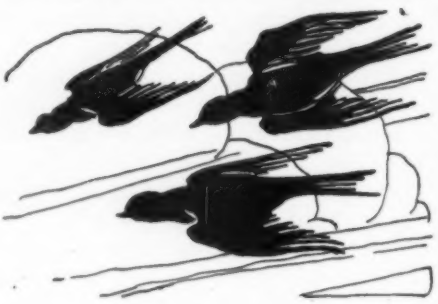
"A worthwhile book full of important information."
—Ohio State Medical Journal.

Price $2.00, incl. postage. 5-day-Money-Back Guarantee

EMERSON BOOKS, Inc., Dept. 570-C, 251 W. 19th Street, New York 11

ORNITHOLOGY

NATURE RAMBLINGS by Frank Thone



Returning Birds

➤ THE SWALLOWS of Mission San Juan Capistrano, at first a California institution, have now assumed the proportions of a national legend. On exactly the same date each spring, local observers declare, the arrowy flocks come in a twittering rush, to reestablish their homes. They are not supposed to deviate by so much as a day from the established calendar.

In southern California's stormless springtime such clocklike punctuality may be possible. In the East, where spring weather is gustier and less dependable, and where a relapse into winter may occur any night, bird arrivals are more irregular. Yet even in that less favored region the dates of the first robin, the first bluebird, the first oriole may be forecast within a week or so with some degree of surety.

Birds really do fly by the clock—the oldest clock of all, the one by which all man-made timepieces are set: the sun. At about the time the farmer says, "Days are getting quite a bit longer; I'd better look over my plows," the birds in their southern winter homes are also feeling the urge to be on the move about their business.

There is no conscious response to the lengthening of daylight hours, as in the case of farmers and other folk whose activities are season-governed. The increasing length of day itself is the stimulus, according to the theory at present most widely accepted. The larger daily doses of light in some way change the internal chemistry of the bird's body, arousing the migration impulse. In similar fashion, the shortening days in autumn set in motion the southward migration.

Experimental support for this seemingly fantastic notion was first produced by a Canadian ornithologist, Dr. William Rowan of the University of Alberta. He caged birds of various species in autumn, and subjected them to artificially lengthened days by means of electric light, as if spring, not winter, were coming. When he released them the bewildered birds started north!

Another Canadian-born naturalist, now an American citizen, Dr. T. Hume Bissonnette of Trinity College, Conn., demonstrated a connection between lengthening daylight and the reproductive cycle in birds, and in mammals also. Since springtime daylight hours arouse in birds the mating and nestbuilding instincts, it can only be expected that they will then move swiftly to the northern homesites where they are used to building their nests.

Science News Letter, March 23, 1946

NAVIGATION

Revision Proposed For Nautical Almanac

➤ REPORTING on a study of methods used by merchant marine navigators during the war, Col. George W. Mixter, author of several textbooks on navigation, proposed a new revision of the time-honored *Nautical Almanac* at the annual meeting of the Institute of Navigation in Washington, D. C.

Designed to incorporate the more simplified forms of the present *Air Almanac* for use in surface navigation, the new edition proposed by Col. Mixter would have fewer tables than the present system uses.

Col. Mixter said that his survey had showed that the Air Almanac has found great favor among ship captains and navigators though it is not required for licensing examinations and is seldom taught.

He said that the proposed change would not decrease the accuracy of figures obtained and would be faster and more convenient for navigators.

The present *Air Almanac* is designed for rapid calculation in flight and is not as minutely accurate as some of the surface navigation tables. Col. Mixter's suggested nautical almanac would have the air edition's tables plus declination and Greenwich hour angle figures down to tenths of minutes.

Science News Letter, March 23, 1946

A lack of *protein* in the diet will delay wound healing.

WAR BARGAINS in LENSES and PRISMS

NOW! MAKE YOUR OWN BINOCULARS!

COMPLETE SET OF LENSES AND PRISMS FROM NAVY'S 7 x 50 MODEL

SAVE UP TO $150.00!

Here's an unusual opportunity to secure a fine set of Binoculars . . . at a tremendous saving of money. Build them yourself with all of the very same optics contained in the Navy's 7 Power Glasses . . . the Binoculars which received such wide acclaim during the war. Depending on your choice, you may buy a near perfect set of Lenses and Prisms for the Binocular construction job, or a set of seconds (exactly the same units, but Lenses are uncemented and have some imperfections). If, however, you wish to construct a Monocular (½ a Binocular) you may do so, choosing either near perfect components or seconds. The Monocular Sets comprise ½ quantities of the same optics required for the Binocular. The full near perfect Binocular Set comprises the following: 2 Cemented Achromatic Eye Piece Lenses, 17.5 mms. diam.; 2 Eye Field Lenses; 4 Porro Prisms; 2 Cemented Achromatic Objective Lenses, diam. 52 mms. Complete assembly directions included, but no metal parts.

Stock #5102-Q Near Perfect Binocular Set ..... **$25.00 Postpaid**
Stock #5103-Q Near Perfect Monocular Set ..... **$12.50 Postpaid**
Stock #5105-Q Seconds for Binoculars. **$11.00 Postpaid**
Stock #5104-Q Seconds for Monocular. **$ 5.50 Postpaid**

FLASH! JUST RECEIVED

We now have Metal Parts and Bodies for Navy's 7 x 50 Binocular. Complete details sent with all orders for sets shown to right or upon request.

All items Finely Ground and Polished but Edges Slightly Chipped or Other Slight Imperfections Which We Guarantee Will Not Interfere with Their Use. Come Neatly Packed and Marked.

TO KEEP POSTED on all our new Optical Items, send 10c and your name and address to get on our regular "Flash" mailing list.

SPECIALS IN LENS SETS

Set #1-Q—"Our Advertising Special"—15 lenses for $1.60 Postpaid, plus 10-page idea booklet. For copying, ULTRA CLOSE-UP SHOTS, macrophotography, experimental optics, magnifying and for making a two power f/16 Telephoto Lens, "Dummy Camera," Kodachrome Viewer, DETACHABLE REFLEX VIEWFINDER for 35 mm. cameras stereoscopic viewer, ground glass and enlarging focusing aids, TELESCOPES, low power Microscopes and for many other uses.

NEW 50-PAGE IDEA BOOK "FUN WITH CHIPPED EDGE LENSES"

Contains wide-variety of projects and fully covers the fascinating uses of all Lenses and in sets listed above . . . only $1.00 Postpaid.

REMARKABLE VALUE!

$141.01 WORTH OF PERFECT LENSES FOR ONLY $10.00

Complete System from Artillery Scope (5X) . . . 9 Lenses, low reflection coated, ABSOLUTELY PERFECT. Diameters range from 1 1/3 inches to 2 1/5 inches. Used for making Telescope and hundreds of other uses.
Stock #5019-Q ..... **$10.00 Postpaid**

SPECTROSCOPE SETS . . . These sets contain all Lenses and Prisms you need to make a Spectroscope plus FREE 15-page Instruction Booklet.
Stock #1500-Q Hand Type Spectroscope ..... $3.45 Postpaid
Stock #1501-Q Laboratory Type Spectroscope ..... $6.50 Postpaid

LENS CLEANING TISSUE—In spite of paper shortage, we offer an exceptional bargain in first quality Lens Cleaning Tissue. You get 3 to 4 times as much tissue as when you buy in the ordinary small booklets. One ream—480 sheets—size 7¾" x 10¾".
Stock #704-Q ..... **$1.50 Postpaid**

RAW OPTICAL GLASS—An exceptional opportunity to secure a large variety of optical pieces, both Crown and Flint glass (seconds) in varying stages of processing. Many prism blanks.
Stock #703-Q 8 lbs. (Minimum weight) ..... $5.00 Postpaid
Stock #702-Q 1½ lbs. ..... $1.00 Postpaid

MAGNIFIER SET—5 magnifying Lenses—Powers from 1 to 10.
Stock #1026-Q ..... $2.00 Postpaid

RETICLE SET—5 assorted, engraved reticles from U. S. Gunsights.
Stock #2035-Q ..... $1.00 Postpaid

ACHROMATIC LENSES

Stock No.	Dia. in mms.	F.L. in mms.	Price
6158-Q*	18	80	$1.00
6159-Q	23	51	1.25
6161-Q	24	48	1.25
6162-Q	25	122	1.25
6164-Q*	26	104	.80
6165-Q	27	185	1.00
6166-Q	29	54	1.25
6168-Q	29	76	1.25
6169-Q	31	122	1.50
6171-Q	32	171	1.00
6173-Q*	34	65	1.00
6176-Q*	38	131	1.00
6177-Q*	39	63	1.10
6178-Q*	45	189	1.50
6179-Q*	46	78	1.25

* ASTERISKED ITEMS are uncemented, but FREE cement and Directions included with uncemented sets.

USES—Use these Lenses for making Projecting Lenses, Low Power Microscope Objectives, corrected Magnifiers, substitute enlarging Lenses, Eye-Piece Lenses, Macrophotography, Gadgets, Optical Instruments, etc., etc.

ALL THE LENSES YOU NEED TO MAKE YOUR OWN TELESCOPE! ALL ARE ACHROMATIC LENSES

GALILEAN TYPE—Simplest to Make but has Narrow Field of View.
Stock
#5018-Q—4 Power Telescope ..... $1.25 Postpaid
#5004-Q—Small 2 Power Pocket Scope ..... $1.00 Postpaid

PRISM TELESCOPES—Use Prism instead of Lenses to Erect Image. Have wide field of view.
Stock
#5010-Q—6 Power Telescope ..... $3.00 Postpaid
#5012-Q—20 Power Telescope ..... $7.25 Postpaid

PRISMS

Stock No.	Type	Base Width	Base Length	Price
3040-Q	Right Angle	33 mms.	23 mms.	$ 1.00
3045-Q	Right Angle	70 mms.	168 mms.	4.00
3001-Q	Lens Surface	20 mms.	14 mms.	2.00
3006-Q	Porro-Abbe	9 mms.	9 mms.	.25
3009-Q	Porro	52 mms.	25 mms.	1.00
3010-Q	Porro	43 mms.	21 mms.	.50
3029-Q	Dove	16 mms.	65 mms.	1.25
3036-Q	80 Degree Roof	60 mms.	36 mms.	4.00
3047-Q	Right Angle	53 mms.	103 mms.	4.00
3038-Q	Roof Prism	18 mms.	84 mms.	2.50

OPTICS FROM 4-POWER PANORAMIC TELESCOPE—Excellent condition. Consists of Objective Prism, Dove Prism, Achromatic Objective Lens, Amici Roof Prism, Eye Lens Set (. . . a $60.00 value)
Stock #5016-Q ..... **$6.00 Postpaid**

MICROSCOPE SETS

Consisting of two Achromatic Lenses and two Convex Eye Piece Lenses which you can use to make a 40 Power Pocket Microscope, or 140 Power Regular Size Microscope. These color corrected Lenses will give you excellent definition.
Stock #1052-Q ..... **$3.00 Postpaid**
Consisting of Prism, Mirror and Condensing Lens. These used together with Stock #1052-Q will make an excellent Micro-projector enabling you to get screen magnification of 400 to 1000 Power according to screen distance.
Stock #1038-Q ..... **$2.00 Postpaid**

RIGHT ANGLE PRISM—Flint Optical Glass, size 41 mm. by 91 mm. by 64 mm. Use in front of camera Lens to take pictures to right or left while pointing camera straight ahead. Also used in front of camera Lens to reverse image in direct positive work. Two of these Prisms will make an erecting system for a Telescope.
Stock #3076-Q ..... **$3.00 Postpaid**

BIG DOUBLE CONVEX LENS—74 mm. diam., 99 mm. F.L. Weighs 9 oz. Made of borosilicate Crown Optical Glass. Used as spotlight Lens, Condensing Lens, etc.
Stock #1048-Q ..... **$1.50 Postpaid**

BIG DOUBLE CONCAVE LENS—74 mm. diam., minus 110 mm. F.L. Made of extra dense Flint. Used as reducing Lens, for trick photography, etc.
Stock #1049-Q ..... **$1.00 Postpaid**

MISCELLANEOUS ITEMS

Stock No.		Price
2024-Q	10 Pieces Circular A-1 Plate Glass (Dia. 31 mm.—for making filter)	$ .25
523-Q	Six Threaded Metal Reticle cells	.25
624-Q	Neutral Ray Filter size 4¾" x 2½"	.25
22-Q	Inclinometer—aircraft type	.25
535-Q	Small First Surface Mirror	30c each
3003-Q	Amici Roof Prism with Corrected Roof	$2.50 each
633-Q	Combination Polarizing and Infra-Red Filters, diam. 20 mm.	50c each

(Minimum order on above $1.00)

SECONDS IN PLANO-CONVEX CONDENSING LENSES

Stock #1061-Q Diam. 6½", F.L. 9" **$2.00 each Postpaid**
Stock #1068-Q Diam. 4 7/16" F.L. 6½" **70c each Postpaid**

We have a large supply of other seconds in Condensing Lenses for Spotlights and Enlargers—diam. from 3½" to 6½"—priced very low. Write for list!

TANK PRISMS—PLAIN OR SILVERED

90-45-45 deg. 5¾" long, 2⅛" wide, finely ground and polished. Perfect condition. Would normally retail from $24 to $30 each.
Stock #3004-Q Silvered Prism **$2.00 Postpaid**
Stock #3005-Q Plain Prism ..... **$2.00 Postpaid**
Illustrated Book on Prisms included FREE.

TANK PERISCOPE

Complete Set Mounted Components Rugged, strong, originally constructed for U. S. Tank Corps. Consists of 2 fine Periscope Mirrors mounted in metal and plastic. Perfect condition. Would normally retail at $40 to $50. **Stock #700-Q. $2.00 Complete Set Postpaid.**

ORDER BY SET OR STOCK NO. • SATISFACTION GUARANTEED • IMMEDIATE DELIVERY

EDMUND SALVAGE COMPANY, P. O. Audubon, New Jersey

MEDICINE

Chemical Fights Disease

War gas unused in World War II gives hopeful lead for attack on Hodgkin's disease and lymphosarcoma. 150 already treated with these agents.

➤ HOPE FOR a chemical conquest of cancer-like conditions such as Hodgkin's disease and lymphosarcoma appeared in a report by Maj. Alfred Gilman, of the medical division of the Chemical Warfare Service, Edgewood Arsenal, at the meeting of the Federation of American Societies for Experimental Biology in Atlantic City.

The chemical warfare agents which gives this hope are the nitrogen mustards. Some 150 patients, about half of them with Hodgkin's disease, have already been treated with these agents.

The nitrogen mustards produce the same effects as X-rays in Hodgkin's disease. Patients have, as they do with X-ray treatment, what doctors call remissions. They get better, but they are not cured.

Maj. Gilman stressed that Hodgkin's disease patients should not be disappointed because they cannot yet get this treatment. The nitrogen mustards do no more, except in a few rare cases, than good X-ray treatments. The exceptions are those rare cases that are X-ray-resistant but which are helped by the nitrogen mustards.

The hope is that new nitrogen mustards can be synthesized which will be even more effective.

Maj. Gilman does not think that even then a cure for Hodgkin's disease will be produced, but that the treatment may be so improved that patients' lives can be prolonged 15 or 20 years.

Any chemist with imagination could make literally 500 nitrogen mustards, Maj. Gilman said. About 50 to 100 are already available. By further trials of these compounds alone and in combination with X-rays the scientists of the Chemical Warfare Service and at hospitals where the compounds are being tried hope to find an effective remedy for Hodgkin's and for lymphosarcoma.

The nitrogen mustards are not effective in any other cancer-like disease. Trials in leukemia were very disappointing.

The compounds act on the cell nucleus and have a selective effect on cells of the body which multiply most rapidly.

Discovery of the remedial action of the nitrogen mustards was made long before the reported experience of shipwrecked men in Bari harbor whose body cells suffered changes after swimming in a sea into which was spilled nitrogen mustard gas. In the fall of 1942 Maj. Gilman, then at Yale University, and Dr. L. S. Goodman, now at the University of Utah, and Dr. G. E. Lindskog of Yale, began investigating their effects on the body. During the last war the skin-blistering, eye-burning effects of mustard gas were chiefly recognized. But Dr. C. Lushbaugh of the University of Chicago, among others, saw that mustards, especially nitrogen mustards which penetrate the skin very well, had other more general effects on the body and affected the bone marrow.

A year before the Bari incident, the Yale group were treating three lymphosarcoma patients with nitrogen mustard. These patients were dying. The X-rays no longer could help them. Nitrogen mustard treatment was given too late and not in proper dosage to save them, but it did prolong their lives for three months. The results were sufficiently encouraging, however, to continue the work of nitrogen mustards as a remedy.

Science News Letter, March 23, 1946

Checking pH With L&N Indicator

Solid construction for long, trouble-free service is the characteristic of this Indicator's quality. Has rugged electrode suitable for many "soft" solids; plenty of amplification for fast, easy-to-make readings, complete shielding for full accuracy in hot, humid places; rigid mountings for complete protection of vacuum tubes and glassware; separate compartment for battery isolation. Ideal for lab or plant.

LEEDS & NORTHRUP COMPANY 4977 STENTON AVE., PHILA 44, PA.
LEEDS & NORTHRUP
MEASURING INSTRUMENTS · TELEMETERS · AUTOMATIC CONTROLS · HEAT-TREATING FURNACES
Jrl. Ad. E-96(22)

CHEMISTRY

Rapid Method of Making Rubber in Germany

➤ A NEW, rapid method of making rubber and a new formula for synthetic rubber were two of the finds made in Germany by an American committee of six chemists and rubber experts who visited Europe in the fall in 1945, sent by the Federal Office of Rubber Reserve. These scientists recommend these two findings to the American rubber industry.

The new rapid method of making rubber, the Redox method, is a process that can be completed, they state, in two to three hours instead of the 12 to 14 hours usually needed. It may prove, they claim, a step toward a continuous process of making rubber.

The new formula for synthetic rubber, labeled "Buna S4," gives a material that requires less heat-softening than other German synthetic rubbers because it uses chemicals in a manner similar to American rubber, though developed by a different approach.

The committee was headed by Prof. Carl S. Marvel of the University of Illinois. Other members included Ensign Edward R. Weidlein Jr., Albert M. Clifford of the Goodyear Company, John N. Street of Firestone, Harlan L. Trumbull of Goodrich, and George R. Vila of United States Rubber.

One major difference between American and German synthetic rubbers, they said, is that American plants making rubber use a chemical which makes the product both softer and easier to handle. The Germans do not use this chemical, but depend upon heat to soften the rubber for processing. German chemists told the committee that they use the heat method because it was the first method developed and because they had the equipment with which to carry it out. Also, they said, they wanted to make one synthetic usable for various purposes.

Science News Letter, March 23, 1946

• Books of the Week •

ANALYTIC GEOMETRY—Francis D. Murnaghan—*Prentice-Hall,* 402 p., diagrs., $4.35. An introductory textbook developing the subject from the point of view of vectors and matrices.

COTTON MAGIC—Mildred Gwin Barnwell—*Jacobs Press,* 114 p., illus., $2. A simple and complete description of cotton manufacturing, containing a useful glossary of textile terms.

COUNSELING WITH RETURNED SERVICEMEN—Carl R. Rogers and John L. Wallen—*McGraw,* 159 p., $1.60. A manual for those who are undertaking counseling responsibilities. Counseling is defined as a process by which the serviceman talks out his problem and comes to understand himself and the problem and sees more clearly the steps which he can independently take toward its solution.

DISCUSSION OF A PHOTOGRAMMETRIC METHOD FOR CONSTRUCTING TOPOGRAPHIC MAPS FROM AERIAL PHOTOGRAPHS—Earl Church—*Syracuse Univ.,* 16 p., diagrs., free. No. 16 in a series on aerial photogrammetry published by Syracuse Univ.

DYNAMICS OF PACKAGE CUSHIONING—R. D. Mindlin—*Bell Telephone System,* 109 p., charts and diagrs., free. A mathematical analysis of the means of predicting the efficacy of protective cushioning in the transportation of packaged articles.

ELECTRONICS FOR ENGINEERS: Reference Articles, Charts, and Graphs from Electronics Magazine—John Markus and Vin Zeluff—*McGraw,* 390 p., charts and diagrs., $6. Material representing condensed information in graph and chart form which has been in great demand for the reference use of engineers engaged in designing circuits, equipment for radio, and electronic, television, radar, sound and related vacuum-tube apparatus.

HEARINGS ON SCIENCE LEGISLATION (S. 1297 and Related Bills): Part 5—*Senate Committee on Military Affairs*—278 p., free. Testimony given by Dr. Henry Allen Moe, John Milton Potter, James B. Conant, Ralph W. Tyler and others. This publication is interesting because of its relation to bill S. 1850 which deals with science legislation.

EXERCISES IN HUMAN PHYSIOLOGY: Preparatory to Clinical Work—Sir Thomas Lewis—*Macmillan,* 103 p., diagrs., $1.25. Practical classroom experiments for the medical student.

EXPERIMENT MANUAL FOR ELECTRONIC DEMONSTRATION—Sol D. Prensky—*Radiolab Pub. and Supply Co.,* 60 p., diagrs. and illus., $2. Suggestions and detailed descriptions for performing modern classroom demonstrations with electronic test equipment.

GEODETIC AND PHOTOGRAMMETRIC PROBLEMS IN CONNECTION WITH THE MAPPING OF A NEW COUNTRY—Jose Fonseca and Leon Cuellar—*Syracuse Univ.,* 80 p., maps and diagrs., free. No. 10 in a series of special bulletins on aerial photogrammetry published by Syracuse Univ.

GOVERNMENT ASSISTANCE IN EIGHTEENTH CENTURY FRANCE—Shelby T. McCloy—*Duke Univ. Press,* 496 p., $6. The story of the catastrophes and suffering which visited the French people in the eighteenth century and of the attempts of the government to eradicate the evils by providing various kinds of education and assistance in hospitals, asylums, refuges, and pensions. A volume which should appeal not only to the social historian but also to the historian of economics, medicine and education.

GUIDE TO SOUTHERN TREES—Ellwood S. Harrar and J. George Harrar—*McGaw,* 712 p., illus., $4.50. Full, simple descriptions of more than 350 arborescent species native to the southern states, together with a review of the important botanical features of leaves, flowers, fruit, bark, etc.

FREEZING TO PRESERVE HOME-GROWN FOODS—H. C. Diehl and K. F. Warner—*Dept. of Agric.,* 62 p., illus., 15 cents. Specific instructions for the preservation of meat, butter, sea food, vegetable, fruit.

INFLATION AND THE AMERICAN ECONOMY—Seymour E. Harris—*McGraw,* 559 p., tables, $5. A comprehensive study of our war and postwar economy; and in particular of the relation of supply and demand to the price structure, with special emphasis given to an evaluation of those forces tending toward inflation or deflation.

JOURNAL OF COLLOID SCIENCE—Victor K. LaMer, Editor-in-Chief—*Academic Press,* Bi-monthly, $10 a year.

MACHINE-TOOL WORK: Fundamental Principles—W. P. Turner, revised by H. F. Owen—*McGraw,* 364 p., tables and illus., $3, 2nd ed. The fundamental problems that are common to all kinds of machine-tool work, including the lathe, planer, shaper, milling machine, drilling machine, etc. New edition contains chapters on Shop Safety, Broaching, and Measurement.

NEW DRUGS—Arthur D. Herrick and Austin E. Smith—*Revere Publ.,* 303 p., tables, $4. Information regarding the legal and research procedures which must take place before a new drug may be released for general use, a book which will be of use to the pharmacologist; the chemist developing and testing new drugs; those concerned with product marketing, and their legal counsel.

A PSYCHIATRIC PRIMER FOR THE VETERAN'S FAMILY AND FRIENDS—Alexander Dumas, M. D., and Grace Keen—*Univ of Minn. Press,* 214 p., illus., $2. A valuable supplement to the personal treatment and counseling of veterans, written for the non-professional reader.

SOUTHERN CALIFORNIA COUNTRY—Carey McWilliams—*Duell,* 387 p., $3.75. A history of Southern California packed with significant information about its famous personalities, the early days of the missions, the origins of Hollywood, and a hundred other subjects.

Science News Letter, March 23, 1946

Elephant hide is so heavy that it takes three years to tan it properly.

ESSENTIAL

for identification markings, for saving time, for speeding up laboratory jobs

The Vibro-Tool writes names or any identifying symbols on test tubes, flasks, watch cases, metallurgical specimens, plastics, steel, stone. A time-saving, important adjunct to smooth laboratory operation. More than 300 Vibro-Tools are used in a single industrial plant by inspectors, foreman, tool cribs, for marking, cutting gaskets, etc. For the craftsman, the Vibro-Tool decorates, embosses, tools, engraves . . . on glass, plastics, metals and leather.

110 V 60 cycle; 120 vertical strokes per sec. With engraving needle $7.50; with set of accessories $16.15.

Order from your laboratory supply house or write direct to

(HANDICRAFT DIVISION)
BURGESS BATTERY COMPANY
198 N. Wabash Avenue Chicago 1, Ill.

·New Machines And Gadgets·

⚙ *HEATED steering wheel cover, to keep an automobile driver's hands warm in cold weather, fits closely the rim of the wheel and is made of leather, rubber or fabric within which a heating coil or heating element is embedded. The heater is connected to the car's electric ignition system.*

Science News Letter, March 23, 1946

⚙ *COAXIAL SPEAKER, particularly for frequency modulation, or FM, reception and high quality phonograph reproduction, consists of two units, each reproducing a portion of the total frequency range. It has a compression-type high-frequency unit attached to the back of a direct-radiator low-frequency unit.*

Science News Letter, March 23, 1946

⚙ *JET-PROPULSION top, a toy, is spun by compressed air escaping through nozzles on its outer surface. Inside the globe-shaped affair, its perpendicular axis is a compression pump which is manually operated by an outside knob on the upper end of its piston. The globular body holds the compressed air.*

Science News Letter, March 23, 1946

⚙ *DISAPPEARING stairway fits snugly into the ceiling of a room between regular joists. It is mechanically attached by levers with a trapdoor in the floor above in such a way that opening either one opens the other. The combination, counterbalanced for ease in operation, is held in either position by gravity.*

Science News Letter, March 23, 1946

⚙ *TINY DRY BATTERY that powered the "handie-talkie" used by Army Signal Corps has now been developed into the commercial model shown in the picture, used principally in hearing aids. Chemical reaction of zinc and mercuric oxide operates the cell; conventional cells use zinc and carbon.*

Science News Letter, March 23, 1946

⚙ *SAFETY RAZOR that floats has a hollow bulbous plastic handle containing a sealed volume of air. It is designed for campers who use the smooth surface of a lake for a shaving mirror.*

Science News Letter, March 23, 1946

⚙ *MAGNESIUM gravity conveyors of the roller type weigh less than half as much as steel conveyors of the same strength. Made in 10-foot units weighing 68 pounds, they are easily combined into long conveyors in industrial plants where longer ones are needed.*

Science News Letter, March 23, 1946

⚙ *METAL wastebasket that smothers out a fire accidentally started in it has double open downward-projecting lids covering the outer part of the circular top. These accumulate the carbon dioxide from a fire in its early stage and use it to prevent further oxygen from reaching the flame.*

Science News Letter, March 23, 1946

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 303.

BOOKS

• SCIENCE NEWS LETTER will obtain for you any American book or magazine in print. Send check or money order to cover regular retail price and we will pay postage in the United States. If price is unknown, send $5 and the change will be returned. When publications are free, send 10c for handling. Address:

Book Department

SCIENCE NEWS LETTER
1719 N ST., N. W.
WASHINGTON 6, D. C.

Question Box

AERONAUTICS

In what ways does the B-50 surpass the B-29? p. 184.

CHEMISTRY

What is the Redox method? p. 190.

What protections against A-bomb radiations are suggested? p. 185.

ELECTRONICS

What is "wind-finding" equipment? p. 180.

ENGINEERING

What further uses for gas turbine engines have been indicated? p. 185.

HERPETOLOGY

What snake laid fertile eggs after four years of confinement? p. 184.

MEDICINE

How can the effects of atomic bombing on the blood, disease resistance and reproduction be determined? p. 179.

How have drugs that fluoresce been traced in their course through the body? p. 185.

What chemical may become effective against cancer-like diseases? p. 190.

What has been found to be the cause of the disease which kills large numbers of buffalo? p. 183.

What new glaucoma weapon is suggested? p. 181.

Why may penicillin and streptomycin be useless in five to ten years? p. 182.

PHYSIOLOGY

How could bathtubs keep pilots from blacking out? p. 183.

Where published sources are used they are cited.

The imprint to the right is mailing address for your Science News Letter.

Date on lower line is expiration of your subscription.

Renew early to avoid lapse in service.

In requesting change of address please give your old address as well as the new one, at least two weeks before change is to become effective.